3.3 Engineering Opportunities and Constraints

This section includes a high-level discussion of significant engineering, environmental, and land-use compatibility opportunities and constraints associated with the Corridor Concept and alternative corridor definitions presented in **Section 3.2**. Specifically, this section includes a discussion of study area drainage and environmental characteristics, the potential for a combined corridor with Salt River Project 500 kV line, crossings of the Gila River, and multi-modal/inter-modal opportunities within the study area.

3.3.1 Drainage

A significant consideration for future development within the study area is drainage and the mitigation of storm water run-off. This section includes a discussion of major drainage issues and features and recommendations for drainage mitigation.

3.3.1.1 Major Basin Description

The entire project area is in the watershed of the Gila River and can be divided into three general watershed sub-basins. The first sub-basin covers about the northern two-thirds of the project area. The southern boundary of this general sub-basin is the Magma Arizona Railroad bed. The second sub-basin is the area south of the Magma Arizona Railroad to the Gila River. The third and smallest sub-basin is the area south of the Gila River.

The northern sub-basin of the project drains to the East Maricopa Floodway or Queen Creek Wash. Queen Creek wash is a tributary to the Sanoqui Wash, which is a tributary to the Gila River. The Sanoqui Wash does flow through a portion of the East Maricopa Floodway east of the project limits before discharging into the Gila River. Land use in this basin is alluvial desert in the upstream portions of the watershed to agriculture, low density housing, and subdivision development in the downstream portions.

The middle sub-basin lies between the Magma Arizona Railroad to the north and the Gila River to the south. The upstream segments of this sub-basin are desert alluvium in the State Trust lands and private agricultural lands in the downstream. There are no major drainage channels in this sub-basin. The Middle and Lower Magma Channels deliver the discharge from the Magma Flood Retarding Structure to the Gila River. Land use in the sub-basin is alluvial desert upstream and mostly agricultural lands downstream. There are several residential sub-divisions currently under construction in this area.

The southern sub-basin is composed of the area south of the Gila River. All storm water runoff from these areas is discharged into the river. Land use in this sub-basin consists of agriculture, mixed use, and residential housing in the town limits of Florence.

A. Drainage Facilities

The major drainage feature and ultimate discharge for the entire watershed is the Gila River. The Gila is an ephemeral river that has undergone drastic

morphologic changes upstream and downstream of the project area due to dams, diversions, and in-stream sand and gravel mining.

The next major drainage feature in the project area is the Queen Creek Wash. Queen Creek Wash is also an ephemeral wash that is dry except after significant rainfall events. The Whitlow Ranch Dam upstream of the project boundary has minimized the flooding threat from the upstream watershed. The dam is located east of the project area upstream of Queen Valley. Queen Creek Wash is also controlled by the Sonoqui Detention Dam that is upstream of the CAP. The wash has been subject to a great deal of in-stream mining that has lead to instability in the channel and has several non-engineered levees throughout its length.

B. Dams and Reservoirs

There are several dams and reservoirs that interrupt the natural drainage patterns that existed historically in the watershed and essentially split the watershed. The Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures were designed and built by the Natural Resources Conservation Service (NRCS) in the late 1960's. They were designed to detain storm water runoff from 100-year return frequency storm event and slowly release it downstream. The structures discharge into the Powerline Floodway, which conveys the low flows from the structures to the East Maricopa Floodway approximately 12 miles downstream east of the project area. The Powerline Floodway is a concrete lined channel with a trapezoidal cross-section that has a top with of about 20 feet. The Flood Retarding Structures are immediately upstream of the Central Arizona Project Canal. The structures are owned by the NRCS and are operated and maintained by the Flood Control District of Maricopa County.

The Sonoqui Detention Dam was built and constructed by the Bureau of Reclamation to protect the Central Arizona Project Canal from the effects of flooding upstream of the canal. The Sonoqui Detention Dam is south and essentially an extension of the Rittenhouse Flood Retarding Structure. The dam also controls the flows in the Queen Creek Wash. Discharge is released from the dam through four 72-inch diameter culverts that cross the CAP. The dam ends at the Magma Arizona Railroad.

The Magma Flood Retarding Structure is similar to the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures in that it was designed and constructed by the NRCS in the early 1960s. The Magma Flood Retarding Structure is south of the Sonoqui Detention Dam and begins on the south side of the Magma Arizona Railroad bed, but is approximately two miles upstream of the CAP. The dam is owned by the NRCS and operated and maintained by the Magma Flood Control District.

Together, the CAP and dams are the most significant drainage divide in the project area. All areas downstream of the CAP and dams are protected from the 100-year return frequency storm event by the CAP and dams. All of the dams average between 20-30 feet tall and will impound water up to that level on the upstream side. All dams have emergency spillways for the

release of storm water above the runoff volume associated with the 100-year storm event.

C. Other Infrastructure

As stated, the Central Arizona Project Canal also affects the historic drainage patterns of the project area along the five dams. There are a series of culverts that cross the CAP canal at irregular intervals. Some storm water runoff that would exceed the capacity for the dams or be accumulated between the dam and the CAP in the case of the Magma Flood Retarding Structure would be captured by the CAP and carried downstream along the slope of the CAP canal until the capacity of the CAP were exceeded.

While other local roadway and agricultural infrastructure has drastically altered the drainage patterns in smaller localized areas, they do not significantly alter the drainage pattern of the project area as a whole.

3.3.1.2 Drainage Issues

This section includes a discussion of major issues associated with drainage within the study area.

A. Regional Hydrology

The most significant drainage issue in the eastern project area upstream of the dams and CAP is the alluvial fan flooding that can occur. Alluvial fans are created where the topographic gradient reduces from the mountains to the desert valleys and the capacity to move sediment is reduced. The sediment carried to this point is then spread out over a wide area. Alluvial fan flooding consists of shallow flooding over a wide area. There is uncertainty with the location of the flooding channel on an active alluvial fan and the morphology of the small alluvial fan channels can change after major storm events. Flooding on an alluvial fan can quickly alter is course across the fan thereby increasing the flood hazard on the entire floodplain.

B. Localized Flooding

The areas downstream of the dams and CAP are protected from the 100-year storm by the dams. The most significant drainage issues in these lands is localized flooding and ponding that backs up behind the embankments used for roadways, railways, and agriculture ditches and infrastructure. There are some areas downstream of the dams are that native alluvial desert, but the drainage issues and potential for flooding would be lower than the potential upstream of the dams. The vast majority of the floodwater and sediment source has been cut off from the upstream watershed by the dams and the CAP.

Drainage issues south of the Gila River include localized flooding from roadway and agricultural infrastructure and flooding from the Gila River should the flooding leave the main channel section of the river.

C. Scour, Sediment, and Erosion

Scouring, erosion, and sediment deposition can all have negative impacts in the project area. Sand and gravel mining has altered the equilibrium of the Gila River and Queen Creek Wash channels. In-stream mining facilities could affect the stability of some transportation structures unless designs are completed to protect the structures. Localized scour at culvert outlets can be prevented through the proper selection and construction of scour countermeasures. Sediment deposition can occur in areas of topographic slope change or behind embankments.

D. Emergency Spillway Discharges

An additional drainage issue would be for rare rainfall events above the 100-year frequency event. The dams built upstream of the CAP were built to detain the 100-year storm event. Runoff would be discharged through the emergency spillways during larger events. The emergency spillways are located on the ends of the dams and could cause widespread flooding if the emergency spillways ever operated.

E. FEMA Regulation Floodplains

Several washes in the project area have been designated by the Federal Emergency Management Agency (FEMA) as Zone A flood hazard areas. Zone A is a Special Flood Hazard Area inundated by 100-year flood, but no base flood elevations are determined. The section of the Gila River through the Town of Florence has been designated as Zone A8. Base Flood Elevations and flood hazard factors have been determined. It is possible that some or all of the Zone A washes downstream of the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures could be removed from FEMA regulation in the future. These Zone A washes were delineated prior to the construction of the dams. Since the dams were designed to detain the 100-year flow event, the contributing watershed on the downstream section of the washes is significantly smaller and may not produce enough discharge to be designated as a FEMA wash.

F. Other Drainage Resources

Several major drainage studies have been completed in parts of the project areas.

- East Mesa Area Drainage Master Plan was completed for the Flood Control District of Maricopa County. This study covered the area downstream of the Powerline Vineyard Road and Rittenhouse Flood Control Structures to the western limits of the project area with the southern boundary being approximately Queen Creek Road.
- The Queen Creek/Sanoqui Wash Hydraulic Master Plan was completed for the Flood Control District of Maricopa County. The study area for this project was also the area downstream of the Central Arizona Project Canal between Queen Creek Road to the north and Hunt Highway to the south.

- Structure Assessments for the Powerline, Vineyard Road, and Rittenhouse Flood Control Structures were completed for the Flood Control District of Maricopa County. The study assessed the current condition of the structures.
- The Arizona State Lands Department is planning to complete a master drainage study for all State Trust lands.
- The Pinal County Department County of Public Works is completing a drainage inventory for all lands in Pinal County over the next five years.

3.3.1.3 Drainage Conclusions

An overview of drainage features is presented in **Figure 3-5**, *Drainage Features*. Based on the information presented in the preceding sections, several issues should be considered in selection of the corridor definition. These are:

- Areas downstream of the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures are protected from the 100-year return frequency storm event by structures themselves. The Central Arizona Project Canal adds additional flooding protection.
- Lands immediately downstream of the dams and the Central Arizona Project Canal also become the new apex for the alluvial fan areas downstream. Sediment movement and volume in this area is minimized by being cutoff from the upstream sediment supply.
- Drainage plans must consider the effects of alluvial fan formations and flooding in the upstream sections of the project areas.
- Bridges or culverts crossing major washes should be designed to protect the roadway from impacts of scouring or erosion.
- Any alteration to any Natural Resource Conservation Service structure – Powerline, Vineyard Road, Rittenhouse, or Magma Flood Retarding Structure, or any of the associated floodways would require the approval of the NRCS.
- Alteration to the Sonoqui Detention Dam would require the approval of the CAP and or US Bureau of Reclamation.

3.3.2 Land Subsidence and Fissures

Ground-water depletion throughout many parts of central and southern Arizona has caused significant declines in the water table level. Lower water tables result in land subsidence and earth fissures which pose geologic hazards and engineering challenges in many parts of southern Arizona. Differential land subsidence and earth fissures have damaged a variety of engineering structures including buildings, streets, highways, railroads, earthen dams, water wells, water distribution systems, and waster-water treatment facilities[5]. Large portions of the study area are known to have experienced significant declines in the water table level. Information obtained from the Arizona Geological Survey[6] depicts that in some areas within the study area the water table has declined over 300 feet, resulting in land subsidence and areas with high concentrations of fissures.

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5 Schumann, Herbert H., and Genualdi, Robert B. Land Subsidence, Earth Fissures, and Water-Level Changes in Southern Arizona, 1986)

[6] *Arizona Bureau of Geology and Mineral Technology, Geological Survey Branch, Map 23, 1986*

Earth fissures first appear as narrow cracks that are generally less than 1 inch wide or as alignments of shallow holes or sink-like depressions that are typically less than 3 inches in diameter. They can range from a few feet to more than one-half mile in length. Throughout central and southern Arizona, water flowing into fissures has produced gullies as deep as 16 feet as and wider than 50 feet.

Land subsidence and earth-fissure damage are important considerations during the design of major engineering structures in areas of measured subsidence. Within the Pinal County Corridors study area, land subsidence and fissures are particularly evident near US 60 in the Apache Junction area and along Hunt Highway in southeast Maricopa County as depicted in **Figure 3-6**, *Land Subsidence and Earth Fissures.* The Picacho area south of Coolidge has also experienced measurable subsidence and earth fissures.

The CAP canal is an example of a horizontal engineering structure that has carefully considered subsidence and fissures into its design and includes steel-reinforced sections to maintain structural integrity until fissures can be repaired. The CAP route was planned to bypass known areas of subsidence and fissure, though it inevitably passes close to areas of known fissures.

3.3.3 The Central Arizona Project Canal

The Central Arizona Project canal (CAP) comprises a 336-mile-long system of aqueducts, tunnels, pumping plants, and pipelines. Constructed by the U.S. Bureau of Reclamation, the CAP transports approximately 1.5 million acre-feet of Colorado River water per year to agricultural, urban residents, and Indian Communities in Pima, Pinal, and Maricopa counties. The CAP extends from Lake Havasu to the southern boundary of the San Xavier Indian Reservation located 14 miles southwest of Tucson. The CAP is managed and operated by the Central Arizona Water Conservation District (CAWCD).

The CAP passes through the heart of the Pinal County Corridors study area, approximately bisecting the study area in two. Entering the study area in Apache Junction between Meridian Road and Ironwood Road, the CAP runs in a south-southeasterly direction approximately parallel to the Hunt Highway corridor. Much of the CAP is located on Arizona State Trust Land, with sections passing through private, Bureau of Land Management, and military land. The average width of the canal is 80 feet across. Some segments of the canal are oversized sections that act as an internal reservoir system and are 160 feet across.

Because of the CAP's geographic spans and magnitude, any new transportation corridors within the study area will have to consider the CAP throughout the corridor development process. Considerations, among others, must include grade-separated crossings, drainage, and environmental protection. The Central Arizona Water Conservation District will be an important stakeholder and should be invited to participate in the future corridor development process.

Because of the CAP's centralized location within the study area, and its northwest to southeast orientation, locating the transportation corridor directly west of the CAP has been suggested by multiple stakeholders as a desirable alternative corridor for a transportation corridor. This is discussed in more detail in **Section 3.3.5**.

3.3.4 SRP500 kV Line

The Arizona Corporation Commission voted on August 16, 2005 to confirm a Certificate of Environmental Compatibility for the Pinal West-to-Southeast Valley/Browning project. The project includes new 500 kilovolt (kV) and 230 kV transmission lines and substations that will serve Pinal and Maricopa Counties. The project is planned jointly by the Salt River Project Agricultural Improvement and Power District (SRP), Arizona Public Service Company, Tucson Electric Power Company, the Santa Cruz Water and Power Districts Association, Electrical District Number 2, and Southwest Transmission Cooperative Inc. The project is managed by SRP [7].

As applicable to the corridor definition study area, the approved route for the new 500 kV transmission line enters the study area on Valley Farms Road at SR-287. The approved route follows Valley Farms Road north until it intersects the Union Pacific Railroad. The line parallels the Union Pacific Railroad until it intersects with the Arizona Magma Railroad, and then follows the Arizona Magma Railroad until it intersects with the CAP. The transmission line route is then located directly adjacent to the west side of the CAP and continues in a north-northwest direction until approximately the intersection of the CAP and Idaho Road.

Two substation sites are proposed as part of the project. These are located at the intersection of the CAP and the Magma Arizona Railroad, and adjacent to the CAP between Pecos Road and Germann Road. The approved route of the 500 kV transmission line is shown in **Figure 3-7**, *Approved Route for SRP 500 kV Line*. The approved route provides SRP with a 1000 ft. corridor of which it will ultimately select 160 feet for an easement.

In order to minimize the impact of the SRP 500 kV line and a transportation corridor on future master planned communities and developments, it has been suggested by multiple stakeholders to locate the transportation corridor, where feasible adjacent to the 500 kV transmission line. This is discussed in more detail in **Section 3.3.6**.

3.3.5 Shared Use Paths and Trails

Pinal County's recently completed Trails Plan (2005) establishes the framework for a countywide system of non-motorized and motorized trails. The planning framework incorporates existing regional trail corridors, quasi-public corridors, such as utility easements, floodplains, abandoned railways, and road rights of way.

The Central Arizona Project Canal corridor is identified as an important public corridor that provides linkages and access with regional trail systems bordering the county. The Plan states that Pinal County has over 50 miles of CAP canal system that would provide a not only a quality trail system for county residents but also an important regional link to both Pima County and Maricopa County. The plan calls for developing a feasibility study before residential development occurs along the CAP canal corridor so that easement, right-of-way, crossing barriers, and access issues can be resolved. Discussions with Pinal County staff suggested that a transportation corridor may be compatible with a combined CAP/500kV/Trail corridor, as is discussed in **Section 3.3.6**. As such, it is recommended that future trail feasibility studies address access to and from the trail system and address mitigation that would be required for a combined trail/transportation/utility corridor. The

[7] *Salt River Project, "AZ Power Planning for Arizona's Future, PW-SEV/BRG transmission project", August 12, 2005.* http://www.azpower.org/pwsevbob/

trail corridor would exist on top of the maintenance road that would exist in conjunction with the 500 kV line.

3.3.6 Shared CAP/SRP 500 kV Line/Trails/North-South Corridor

As described in **Section 3.3.3**, and **Section 3.3.4**, the CAP, SRP 500 kV transmission line approved route and the North-South corridor all share a common element – transport of goods and commodities (e.g. water, electricity, and vehicles) in a northwest-southeast direction,. Because of the potential common 'footprint' of these large, horizontal engineering structures (CAP and 500 kV line), and the potential for a new large transportation corridor (North-South corridor), stakeholders have repeatedly suggested that where possible, the SRP line and the North-South corridor should be collocated in to a 'utility and transport' corridor. Consolidation of as much infrastructure as possible into a 'utility and transport corridor' would minimize the adverse impacts to future residents and reduce the mitigation that will be required as development continues. In addition, Pinal County has proposed developing a linear parkway and trail system[8] along the CAP alignment that may be compatible with the 'utility and transport' corridor.

SRP has stated that they would not object to transportation corridor directly adjacent to the 500 kV line. SRP would need to consider a transportation corridor in the design and construction of the transmission line structures. Sufficient vertical access would need to be maintained over roadway crossings that provide access to and from the transportation corridor. The Arizona State Land Department, which owns much of the land over which the corridor crosses, has stated that they would prefer the 'transport and utility' corridor to be located on the west side of the CAP. Locating the 'transport and utility' corridor on the west side of the CAP would reduce the impact to State Land east of the CAP. In addition, locating the corridor on the west side of the CAP provides much-needed protection to downstream (the west of the CAP) lands and structures from alluvial fan flooding that is seen to the east of the CAP. In addition, a combined corridor would also need to accommodate the railroad.

3.3.6 Gila River Crossing

The Gila River is a major east-west feature that passes through the study area. The river, particularly during times of inclement weather, can significantly inhibit north-south travel. In addition, the river presents a large obstacle to the continuity of the arterial street system.

Stakeholders have expressed a strong desire for an additional crossing of the Gila River. Currently, the only all-weather crossings located to the east of the Gila River Indian Community are located at Attaway Road and on SR-79. As it pertains to the North-South corridor, a new crossing of the Gila River would be required in order to connect the North-South corridor to SR-287. A connection to SR-79 would not require a new crossing of the Gila River, though improvements to the existing crossing on SR-79 may be required.

3.3.7 Right-of-Way Requirements

A new 6-lane, access controlled freeway corridor would require approximately 300 feet of right-if-way. Connections to both SR-79 and SR-287 would require that new right-of-way be obtained for the entire length of the corridor.

[8] *Pinal County Trails Plan, 2005*

However, if the North-South corridor is connected to SR-79 at Arizona Farms Road, and it is decided that the North-South corridor should be extended to SR-287 via Arizona Farms Road, additional right-of-way would be required on SR-79. Currently, ADOT records show that 200 feet of right-of-way are available on SR-79 through the Florence area. Existing right-of-way within the study area is shown in **Figure 3-8**, *Existing ADOT Right-of-Way*.

3.3.7 Summary of Engineering Opportunities and Constraints

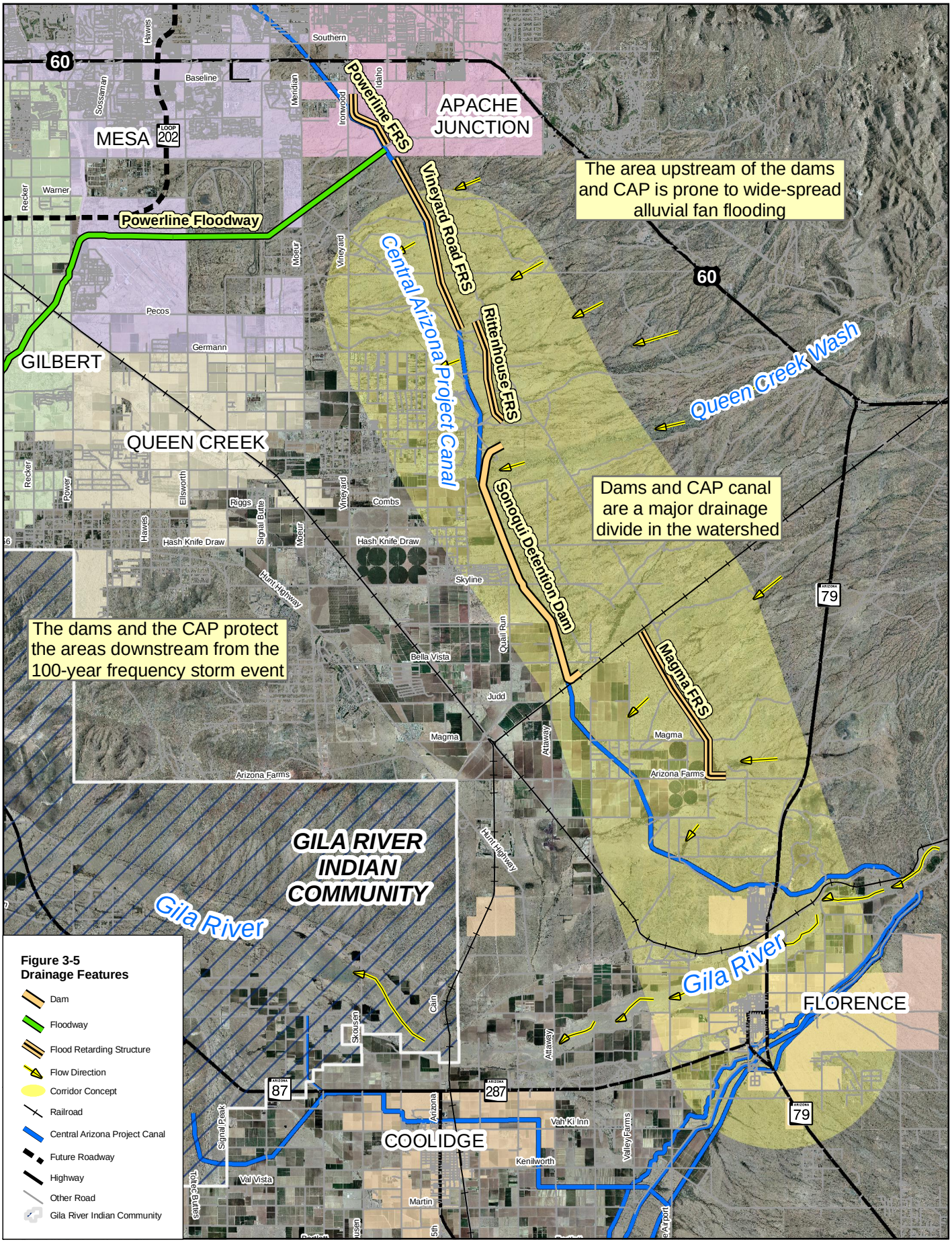
A summary of engineering opportunities and constraints for the definition alternatives is presented in **Table 3-1**.

Table 3-1 – Summary of Engineering Opportunities and Constraints

Corridor Definition Alternative	Engineering Opportunities	Engineering Constraints
North-South corridor from Williams Gateway Corridor (Frye Rd. alignment) **to Arizona Magma Railroad** near Judd Rd	• North-end connection of corridor definition can accommodate any alignment ultimately identified for Williams Gateway Corridor. • Corridor location west of CAP is preferable from drainage perspective. Areas downstream of the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures are protected from the 100-year return frequency storm event by structures themselves. The Central Arizona Project Canal adds additional flooding protection. • A connection to SR-287 could parallel the approved 500 kV transmission line alignment where feasible. A shared corridor is compatible with both CAP and SRP 500 kV transmission line uses • Fissures and subsidence has been well documented along CAP alignment. Future fissures could be mitigated for both the CAP and transportation corridor.	• Drainage plans must consider the effects of alluvial fan formations and flooding in the upstream sections of the project areas. • Bridges or culverts crossing major washes should be designed to protect the roadway from impacts of scouring or erosion. • Any alteration to any Natural Resource Conservation Service structure – Powerline, Vineyard Road, Rittenhouse, or Magma Flood Retarding Structure, or any of the associated floodways would require the approval of the NRCS. • Alteration to the Sonoqui Detention Dam would require the approval of the CAP and or US Bureau of Reclamation. • Collocating corridor with railroad, CAP, and 500 kV transmission line increases the length of east-west grade-separated interchanges and crossings required. It is estimated that at potential interchange areas the corridor may need to be offset from the CAP, SRP 500 kV line and railroad by up to 1500 feet to provide the necessary vertical clearance above the railroad and under the transmission line. • Transmission lines may need to be constructed higher than would normally be required to provide minimum vertical clearance. • Proposed SRP substation sites are located adjacent to the CAP alignment. However, ultimate location for substations has not been selected, allowing opportunity to coordinate with SRP.
Southern Connection Alternative 1: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-79	• A connection to SR-79 reduces the total project cost by ADOT as the overall corridor is shorter and a connection to SR-79 does not necessitate a new bridge over the Gila River • A connection to SR- 79 via Magma Dam area is an opportunity	• A connection to SR-79 may require significant improvements to SR-79 in Florence including right-of-way acquisition that may significantly impact existing structures. This connection would also require access and interchange improvements at Corrections facilities and at SR-287 /SR-79 junction. • Connection to SR-79 'misaligns' the North-South corridor from straight-line to Clemens Road alignment, which may become a major transportation facility beyond the year 2030.

Table 3-1 –Summary of Engineering Opportunities and Constraints (continued)

Corridor Definition Alternative	Engineering Opportunities	Engineering Constraints
Southern Connection Alternative 2: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-287 near Valley Farms Road.	• A connection to SR-287 could parallel the approved 500 kV transmission line alignment where feasible. • A connection to SR-287 would provide an additional crossing of the Gila River. Valley Farms, Felix, and Attaway Roads are assumed to be multi-lane roadways with bridges over the river. If these are not constructed as river crossings, then the SR-287 connection is desirable to provide a river crossing. • A connection to SR-287 near Valley Farms Road is more closely aligned with the Clemens Road alignment, which is envisioned by City of Coolidge to become a major transportation facility beyond 2030 that would provide access to the Coolidge airport, regional shopping centers, and to SR-87/I-10.	• A connection to SR-79 may require improvements to SR-79 in Florence including right-of-way acquisition that may significantly impact existing structures. This connection may also require access and interchange improvements at Corrections facilities and at SR-287 /SR-79 junction.


The area upstream of the dams and CAP is prone to wide-spread alluvial fan flooding
Dams and CAP canal are a major drainage divide in the watershed
The dams and the CAP protect the areas downstream from the 100-year frequency storm event
APACHE JUNCTION
MESA
GILBERT
QUEEN CREEK
GILA RIVER INDIAN COMMUNITY
COOLIDGE
FLORENCE
Powerline FRS
Vineyard Road FRS
Rittenhouse FRS
Central Arizona Project Canal
Sonoqui Detention Dam
Magma FRS
Queen Creek Wash
Powerline Floodway
Gila River
Gila River
Hunt Highway
Hash Knife Draw
Arizona Farms
Magma
Bella Vista
Skyline
Judd
Quail Run
Combs
Riggs
Signal Butte
Ellsworth
Germann
Pecos
Warner
Baseline
Southern
Hawes
Sossaman
Meridian
Ironwood
Idaho
Recker
Power
Moeur
Vineyard
Attaway
Cain
Skousen
Arizona
Signal Peak
Vah Ki Inn
Kenilworth
Valley Farms
Val Vista
Martin
Tohec Butler
Airport
60
202
87
287
79
Figure 3-5
Drainage Features
Dam
Floodway
Flood Retarding Structure
Flow Direction
Corridor Concept
Railroad
Central Arizona Project Canal
Future Roadway
Highway
Other Road
Gila River Indian Community
N
0 1 2 3 4 5 Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT

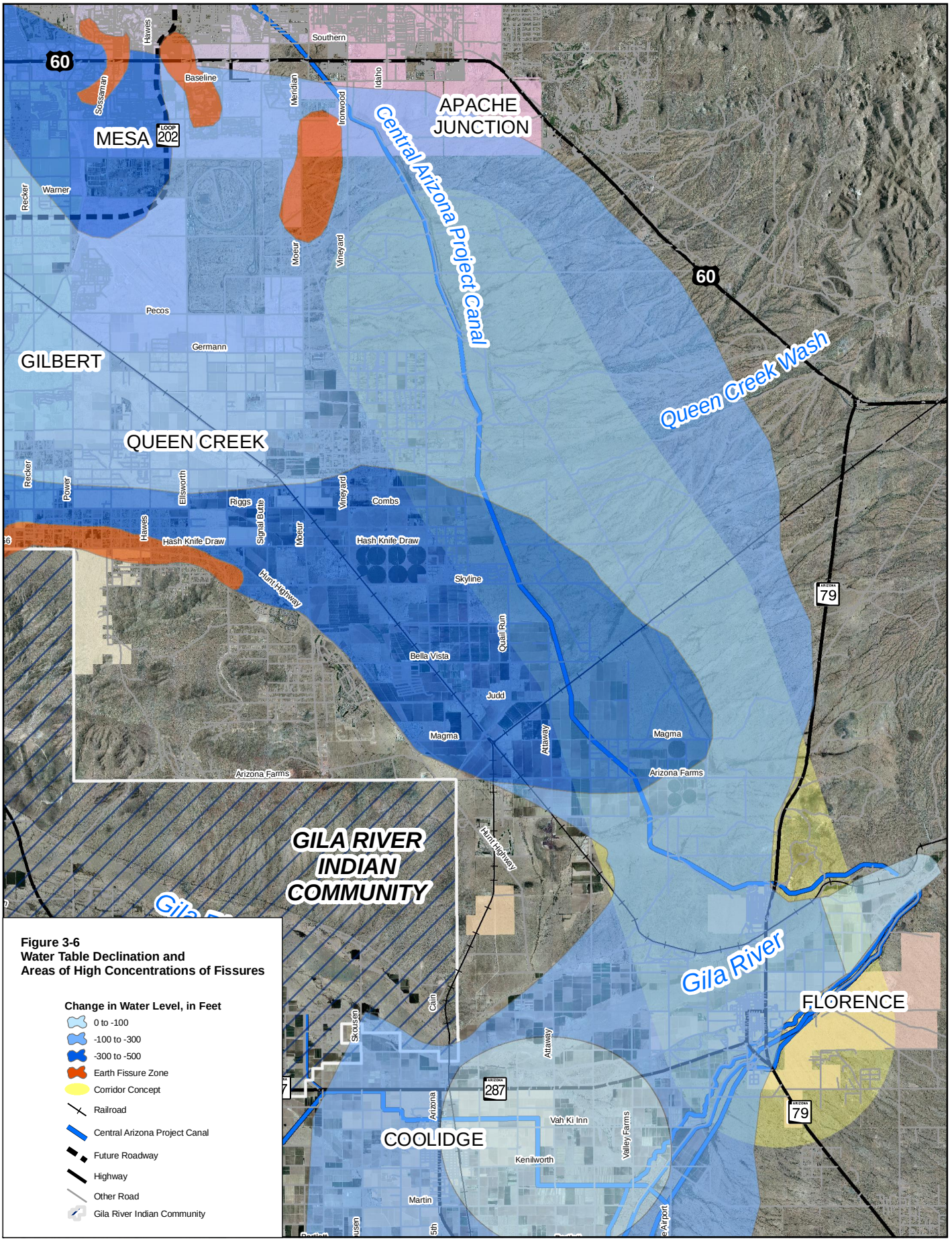


Figure 3-6
Water Table Declination and
Areas of High Concentrations of Fissures

Change in Water Level, in Feet

- 0 to -100
- -100 to -300
- -300 to -500
- Earth Fissure Zone
- Corridor Concept
- Railroad
- Central Arizona Project Canal
- Future Roadway
- Highway
- Other Road
- Gila River Indian Community

N

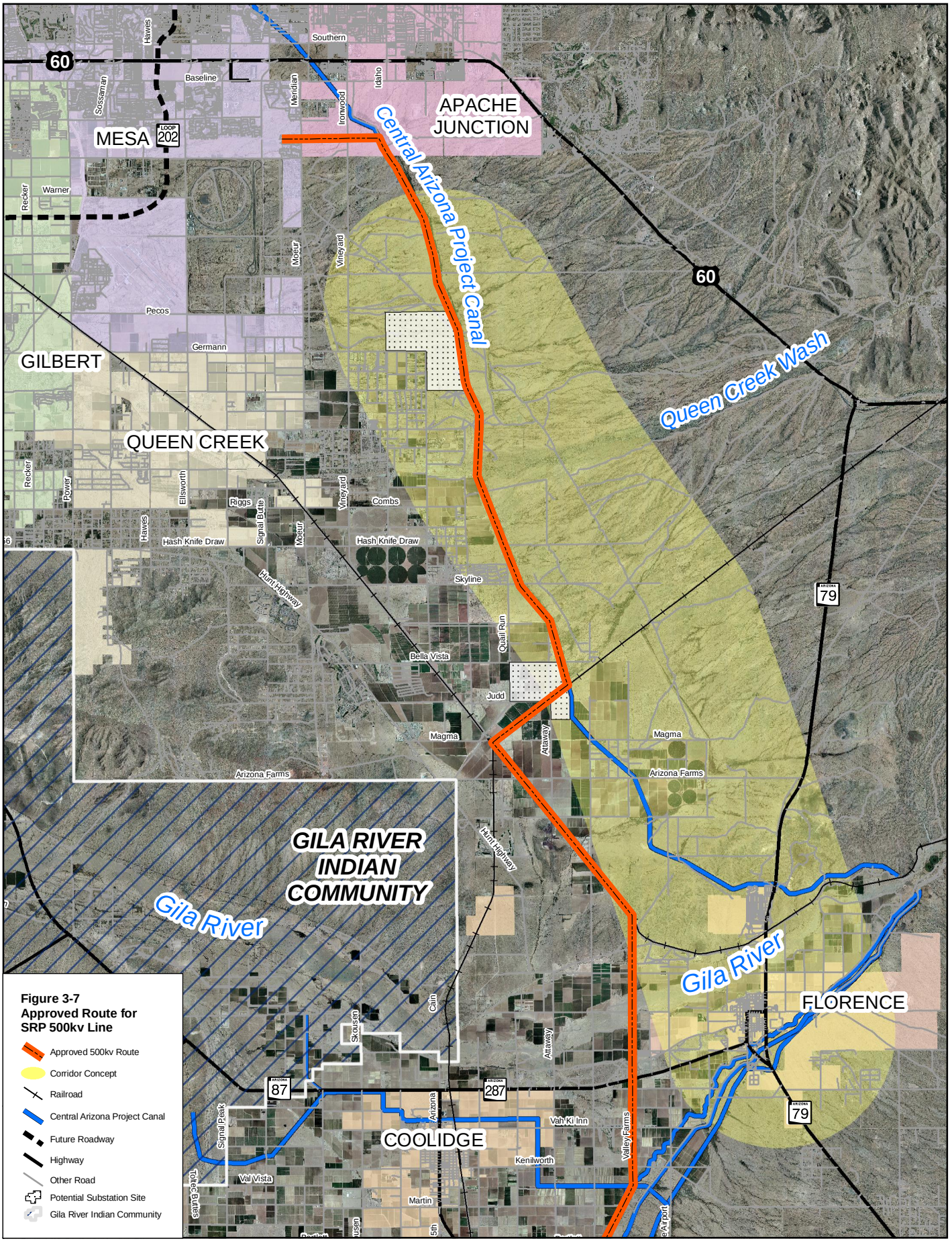
0 1 2 3 4 5 Miles

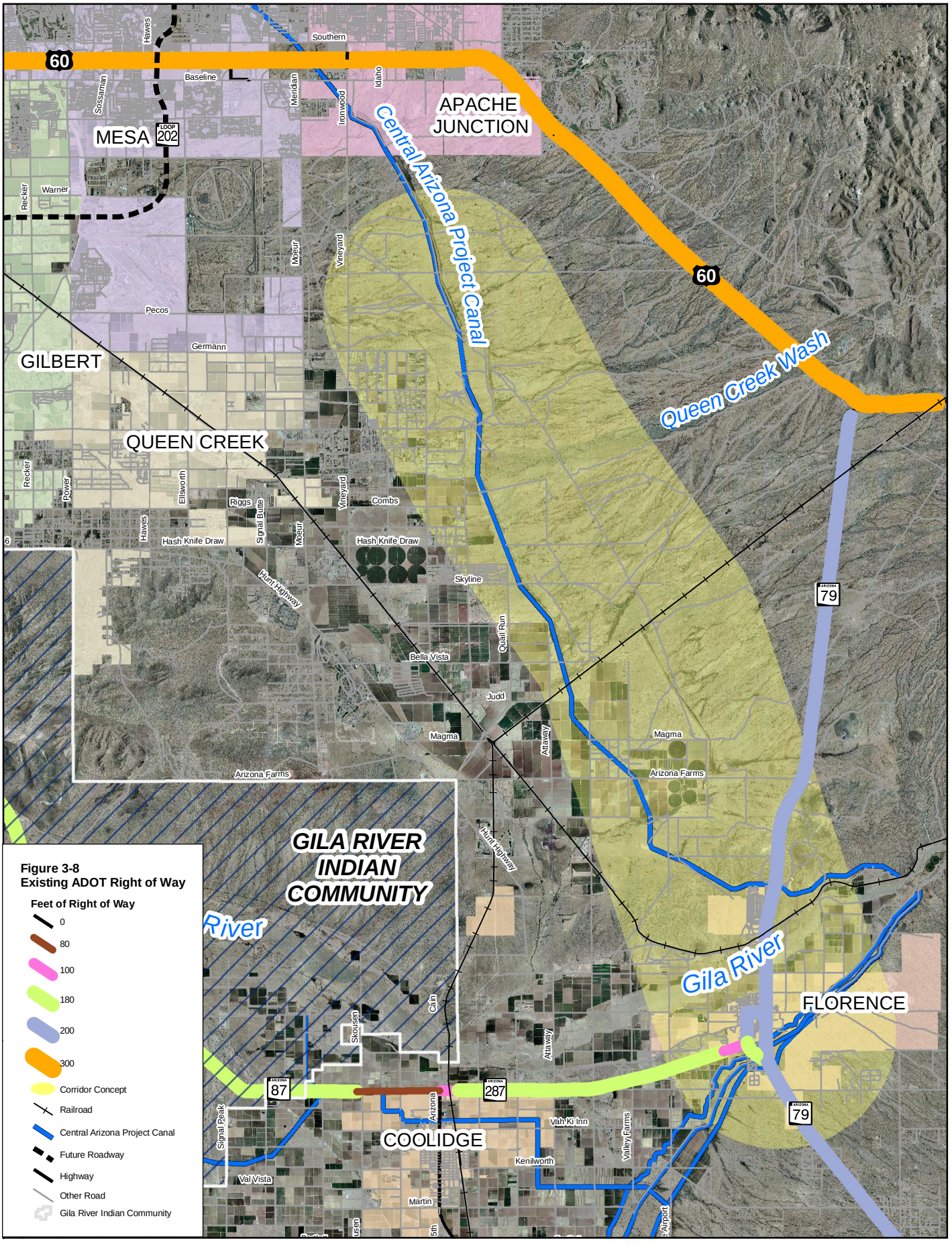
Data Source:
Arizona Land Resource Information System

PINAL COUNTY CORRIDORS DEFINITION STUDY

Kimley-Horn and Associates, Inc.

ADOT


60
Hawes
Southern
Baseline
Sossaman
Meridian
Idaho
Ironwood
APACHE JUNCTION
MESA
LOOP 202
Central Arizona Project Canal
Recker
Warner
Moeur
Vineyard
Pecos
Germann
GILBERT
Queen Creek Wash
QUEEN CREEK
Power
Ellsworth
Riggs
Signal Butte
Combs
Hash Knife Draw
Skyline
Hunt Highway
79
Quail Run
Bella Vista
Judd
Magma
Attaway
Arizona Farms
GILA RIVER INDIAN COMMUNITY
Gila River
Cain
Skousen
87
287
Arizona
Signal Peak
Vah Ki Inn
COOLIDGE
Valley Farms
Kenilworth
Val Vista
Toltec Butters
Martin
5th
FLORENCE
Figure 3-7
Approved Route for
SRP 500kv Line
Approved 500kv Route
Corridor Concept
Railroad
Central Arizona Project Canal
Future Roadway
Highway
Other Road
Potential Substation Site
Gila River Indian Community
N
0 1 2 3 4 5
Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn
and Associates, Inc.
ADOT


60
Hawes
Southern
Baseline
Sossaman
Meridian
Idaho
Ironwood
APACHE JUNCTION
MESA
LOOP 202
Central Arizona Project Canal
Recker
Warner
Moeur
Vineyard
60
Pecos
Germann
GILBERT
Queen Creek Wash
QUEEN CREEK
Recker
Power
Ellsworth
Riggs
Signal Butte
Vineyard
Combs
Hawes
Hash Knife Draw
Moeur
Hash Knife Draw
Hunt Highway
Skyline
79
Quail Run
Bella Vista
Judd
Magma
Attaway
Magma
Arizona Farms
Arizona Farms
GILA RIVER INDIAN COMMUNITY
Hunt Highway
River
Gila River
FLORENCE
Cain
Skousen
Attaway
87
287
Arizona
79
Signal Peak
COOLIDGE
Vah Ki Inn
Valley Farms
Kenilworth
Val Vista
Martin
Airport
5th
Figure 3-8
Existing ADOT Right of Way
Feet of Right of Way
0
80
100
180
200
300
Corridor Concept
Railroad
Central Arizona Project Canal
Future Roadway
Highway
Other Road
Gila River Indian Community
N
0 1 2 3 4 5
Miles
Data Source:
Arizona Land Resource Information System
PINAL COUNTY CORRIDORS DEFINITION STUDY
Kimley-Horn and Associates, Inc.
ADOT